

(43) International Publication Date  
13 January 2005 (13.01.2005)

PCT

(10) International Publication Number  
**WO 2005/002576 A2**(51) International Patent Classification<sup>7</sup>: **A61K 31/4184, C07D 403/04, A61P 35/00, 31/10**

James [GB/GB]; 436 Cambridge Science Park, Milton Road, Cambridge CB4 0QA (GB). WYATT, Paul, Graham [GB/GB]; 436 Cambridge Science Park, Milton Road, Cambridge CB4 0QA (GB). O'BRIEN, Michael, Alistair [GB/GB]; 436 Cambridge Science Park, Milton Road, Cambridge CB4 0QA (GB). NAVARRO, Eva, Figueroa [ES/GB]; 436 Cambridge Science Park, Milton Road, Cambridge CB4 0QA (GB).

(21) International Application Number:  
**PCT/GB2004/002913**

(22) International Filing Date: 5 July 2004 (05.07.2004)

(25) Filing Language: English

(74) Agent: HUTCHINS, Michael, Richard; M.R. Hutchins &amp; Co., 23 Mount Sion, Tunbridge Wells, Kent TN1 1TZ (GB).

(26) Publication Language: English

(30) Priority Data:  

0315657.7	3 July 2003 (03.07.2003)	GB
60/484,685	3 July 2003 (03.07.2003)	US
60/514,170	24 October 2003 (24.10.2003)	US

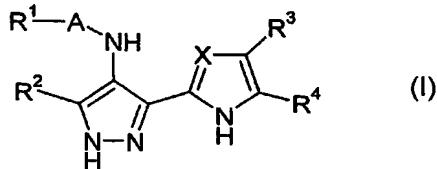
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(71) Applicant (for all designated States except US): ASTEX TECHNOLOGY LIMITED [GB/GB]; 436 Cambridge Science Park, Milton Road, Cambridge CB4 0QA (GB).

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

*[Continued on next page]*

(54) Title: PHARMACEUTICAL COMPOUNDS



(57) Abstract: The invention provides a compound of the formula (I); or a salt, N-oxide or solvate thereof; wherein X is CR<sup>5</sup> or N; A is a bond or -(CH<sub>2</sub>)<sub>m</sub>-(B)<sub>n</sub>; B is C=O, NR<sup>8</sup>(C=O) or O(C=O) wherein R<sup>8</sup> is hydrogen or C<sub>1-4</sub> hydrocarbyl optionally substituted by hydroxy or C<sub>1-4</sub> alkoxy; m is 0, 1 or 2; n is 0 or 1; R<sup>1</sup> is hydrogen, a carbocyclic or heterocyclic group having from 3 to 12 ring members, or an optionally substituted C<sub>1-8</sub> hydrocarbyl group; R<sup>2</sup> is hydrogen, halogen, methoxy, or a C<sub>1-4</sub> hydrocarbyl group optionally substituted by halogen, hydroxyl or methoxy; R<sup>3</sup> and R<sup>4</sup> are the same or different and each is selected from hydrogen, CN, C(O)R<sup>8</sup>, optionally substituted C<sub>1-8</sub> hydrocarbyl and carbocyclic or heterocyclic groups having from 3 to 12 ring members; and R<sup>5</sup> is hydrogen, a group R<sup>2</sup> or a group R<sup>10</sup> wherein R<sup>10</sup> is selected from halogen, hydroxy, trifluoromethyl, cyano, nitro, carboxy, amino, mono- or di-C<sub>1-4</sub> hydrocarbyl amino, carbocyclic and heterocyclic groups having from 3 to 12 ring members; a group R<sup>a</sup>-R<sup>b</sup> wherein R<sup>a</sup> is a bond, 0, CO, X<sup>1</sup>C(X<sup>2</sup>), C(X<sup>2</sup>)X<sup>1</sup>, X<sup>1</sup>C(X<sup>2</sup>)X<sup>1</sup>, S, SO, SO<sub>2</sub>, NR<sup>c</sup>, SO<sub>2</sub>NR<sup>c</sup> or NR<sup>c</sup>SO<sub>2</sub>; and R<sup>b</sup> is selected from hydrogen, carbocyclic and heterocyclic groups having from 3 to 12 ring members, and a C<sub>1-8</sub> hydrocarbyl group optionally substituted by one or more substituents selected from hydroxy, oxo, halogen, cyano, nitro, carboxy, amino, mono- or di-C<sub>1-4</sub> hydrocarbylamino, carbocyclic and heterocyclic groups having from 3 to 12 ring members and wherein one or more carbon atoms of the C<sub>1-8</sub> hydrocarbyl group may optionally be replaced by 0, S, SO, SO<sub>2</sub>, NR<sup>c</sup>, X<sup>1</sup>C(X<sup>2</sup>), C(X<sup>2</sup>)X<sup>1</sup> or X<sup>1</sup>C(X<sup>2</sup>)X<sup>1</sup>; R<sup>c</sup> is selected from hydrogen and C<sub>1-4</sub> hydrocarbyl.; X<sup>1</sup> is 0, S or NR<sup>c</sup> and X<sup>2</sup> is =O, =S or =NR<sup>c</sup>; and R<sup>8</sup> is selected from OR<sup>11</sup>, SR<sup>11</sup> and NR<sup>12</sup>R<sup>13</sup>; R<sup>11</sup> is selected from optionally substituted C<sub>1-8</sub> hydrocarbyl and carbocyclic or heterocyclic groups having from 3 to 12 ring members; and one of R<sup>12</sup> and R<sup>13</sup> is a group R<sup>11</sup> and the other of R<sup>12</sup> and R<sup>13</sup> is hydrogen or C<sub>1-4</sub> alkyl; or R<sup>12</sup> and R<sup>13</sup> and the nitrogen atom to which they are attached together form a saturated heterocyclic group having from 4 to 7 ring members and containing 1,2 or 3 heteroatom ring members selected from N, O and S. The compounds have activity against cyclin dependent kinases glycogen synthase kinase and Aurora kinases.

WO 2005/002576 A2



GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— *without international search report and to be republished upon receipt of that report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*